(B) Remarks

In the Office Action, claims 1-12 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 6,374,185. It was stated in the Office Action that, "Although the conflicting claims are not identical, they are not patentably district from each other because it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the method described in the U. S. Patent No. 6,374,185 to generate an estimate lithology in geophysical exploration using an artificial neural network in correlating seismic data attributes with lithological data."

The position taken in the Office Action that the claims in the present application and the claims in U. S. Patent No. 6,374,185 ("the '185 patent") are not patentably distinct from each other is respectfully traversed. The similarity between the invention in the '185 patent and the present application is that they both apply a correlation between seismic data and lithological data to predict lithology from seismic signals. However, the correlation between seismic data and lithological data that is utilized in the two inventions is quite different. As characterized in its broadest claim (claim 1), in the method of the '185 patent, the correlation between seismic data and lithological information is a correlation between synthetic seismic data calculated from well log data from at least one wellbore and lithological data from the wellbore. In the present invention, an unsupervised learning network is utilized to organize seismic data representing a subsurface region of interest, and this seismic data, after it has been organized by an unsupervised learning network is used for developing a correlation with lithological data. In the present invention, it is this correlation between the seismic data that has been organized by an unsupervised learning network and lithological data that is applied to seismic data to estimate lithology, rather than a correlation between synthetic seismic data calculated from well log data and lithological data.

Note that the process disclosed in the '185 patent utilizes both "real" seismic data, i.e. measured seismic data, and "synthetic" seismic data, i.e. calculations of the expected form of seismic data based on calculations from lithological data. The method of the present application does not utilize any "synthetic" seismic data, so that all references to "seismic data" in the present application are references to what is called "real seismic data" in the '185 patent.

The present invention, with reference to claim 1, comprises a method of geophysical exploration which includes

- using an unsupervised learning network to organize seismic data representing a subsurface region of interest
- correlating a portion of the organized seismic data with lithological data from a well bore located in the subsurface region of interest
- applying the correlation to the seismic data to estimate lithology in the subsurface region of interest.

There are no teachings, disclosures or suggestions in the '185 patent related to any use of an unsupervised learning network More specifically, there are no teachings, disclosures or suggestions in the '185 patent related to using an unsupervised learning network to organize seismic data. The '185 patent describes the use of an artificial neural network; however, the use that is made of the artificial neural network is for correlating lithological data with well log data and for correlating synthetic seismic data with lithological classes.

With respect to the second element of claim 1 of the present application, there are no teachings, disclosures or suggestions in the '185 patent related to correlating seismic data, organized with an unsupervised learning network, with lithological data, or of any other use of seismic data that has been organized with an unsupervised learning network. The correlations that are performed in the '185 patent are:

1) lithological columns obtained from core data are correlated with well log data,

2) lithological column, along with well log data are applied to an artificial neural network and the artificial neural network is used to train the well log data to predict lithology,

3) Coefficients developed by the artificial neural network are applied to well logs from both the actual wells and the model wells to develop lithological column for each well and model well,

4) Synthetic seismic traces are then derived from the acoustic parameters for each well and model well and various "attributes" are then derived from the synthetic seismic data traces, and an artificial neural network is then utilized to train the synthetic seismic data trace attributes to recognize lithological classes,

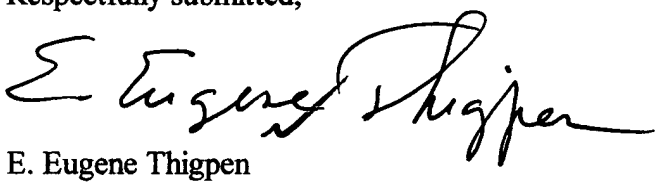
5) The coefficients that were derived by the artificial neural network are then applied to the attributes derived from the real seismic data from the interwell region to generate lithological output data comprising lithological classes from the interwell locations in the region of interest from which the seismic data were recorded.

With reference to the third element of claim 1, there are no teachings, disclosures or suggestions in the '185 patent of applying the correlation (i.e. a correlation of a portion of the seismic data organized with an unsupervised learning network with lithological data from a wellbore) to the seismic data to estimate lithology in the subsurface region of interest. The correlation that is applied in the '185 patent to the seismic data to estimate lithology in the subsurface region of interest is a correlation derived by a neural network which trains synthetic seismic traces derived from well data to recognize lithological classes.

The other independent claims in the present application provide additional distinctions between the present application and the '185 patent. In claim 4, the first two elements delineate the scope of the first element of claim 1 in more detail, and the third element of claim 4 delineates the scope of the second element of claim 1 in more detail. Claim 7 includes an even more detailed delineation of the scope of claim 1. Claims 12, 13 and 14 are claims to a device readable by a digital computer having instructions defining the process and instructions to the computer to perform the process of claims 1, 4 and 7 respectively.

In view of the foregoing remarks, reconsideration and allowance of the pending claims is respectfully requested. A Notice of Allowance is respectfully requested.

Respectfully submitted,



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